

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1- 39 (cancel)

Claim 40 (Currently amended) A method of fabricating a photoacoustic spectroscopy cell formed of top, bottom and inner substrates, comprising the steps of:
forming a resonant cavity and buffer cavities on either side of the resonant cavity in the inner substrate;
joining the inner substrate to a pair of top and bottom outer substrates, thereby encapsulating the resonant cavity; [and]
acoustically coupling a microphone to the resonant cavity[.]; and

[The method of claim 33,] wherein the substrates are silicon and [wherein] the step of acoustically coupling a microphone to the resonant cavity includes the steps of:

depositing a piezoelectric thin film onto one of the top and bottom substrates;
etching and patterning the thin film to create an acoustic sensor; and
forming a port extending from the acoustic sensor into the resonant cavity.

41. (Previously presented) The method of claim 40, wherein the substrates are silicon material coated with one of titanium-gold or tin-gold alloy and further including the step of compressing the substrates together and using temperature and pressure to form a gold-silicon or gold-tin eutectic bond between the substrates.

42. (Previously presented) The method of claim 40 wherein the piezoelectric thin film is selected from the group of lead zirconate titanate (PZT), aluminum nitride (AlN), and zinc oxide (ZnO).